Support to the coordination of national research and innovation programmes in areas of activity of the European Energy Research Alliance

SUPEERA

Policy Brief

THE NEW EUROPEAN RESEARCH AREA

CHALLENGES AND OPPORTUNITIES AHEAD

Setting the scene

The European Green Deal celebrates its first year in 2021, testifying the renovated push from the European institutions to focus the attention of policymaking on the threats posed by climate change. To reach climate neutrality by 2050, the EU will need to incorporate several initiatives in energy and climate to develop a stable and coherent framework for concerted action. Within this framework, the recent agreement reached by the Council of the EU and the European Parliament on the European Climate Law, the centrepiece of the EU Green Deal, represents a key milestone for the EU's ambitions and sets the bloc on a green path towards carbon-neutrality.

The recently approved EU budget and the creation of Next Generation EU, a plan to boost the post-pandemic recovery of Europe, ensure substantial backing to many projects and initiatives supporting the reduction of emissions and promoting the EU's digital ecosystem and its competitiveness. Green investments and collaboration on transnational projects are now crucial to ensure that the efforts of the Member States, industry, and research organisations will not fall short of the set objectives.

To complement the efforts made by policymakers, it is vital to ensure that R&I challenges are addressed in parallel, increasing the collaboration between research and industry to achieve the goals towards a climate-neutral energy system in the EU. The research community has undoubtedly a pivotal role in this process, supporting identified political priorities with empirical findings and developments. It can also advise policymakers on the way forward through fundamental research, particularly focused on low TRLs, for the advancement of breakthrough technologies, materials, and systemic approaches.

In the context of the SUPEERA project, a series of policy briefs are currently being developed to identify concrete R&I challenges in EU policies relevant to the energy research community. The final goal is to support the achievement of the Clean Energy Transition. The analysis of the policies identified has the two-fold objective of supporting recommendations towards the EERA membership and the SET-Plan ecosystem at large, also identifying potential areas for investment in energy R&I for EU policymakers. Specifically, this paper focuses on the new European Research Area, as outlined in the Communication published on 30 September 2020 by the European Commission, as a critical measure supporting the European Green Deal for a cleaner and safer environment.

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A new ERA for Research and Innovation

The European Commission's Communication on "A new ERA for Research and Innovation" puts forward a set of policies promoting cooperation and mobility of ideas and researchers across the EU.

The Communication revolves around four strategic priorities that will guide the EU actions in the months and years to come. The table below provides an overview of these priorities and the related areas for development defined by the European Commission. They are reported as identified R&I challenges. Our analysis focuses only on the areas with the highest potential for further improvements through European R&I actions. As opposed to more thematically focused R&I policies, "A new ERA for R&I" tasks the research community with incorporating new ways of working and communicating with the EU, the Member States, and the industry.

Key priorities	Identified R&I challenges
Prioritising investments and reforms	1) Guarantee an **enhanced alignment of R&I investments and reforms at national and EU level**. 2) Step up the financial support for constructing the ERA through **robust and balanced R&I investments** to support researchers to carry out fundamental research, boosting the collaboration between the EU, industry, and Member States to deliver research and innovation that has an impact on the ground in key policy areas, and support the production of breakthrough and market-creating innovation. 3) **Coordinate R&I investment and reforms efforts** by setting funding targets that can have a mobilising effect over national R&I budgets and leverage private R&I investments. 4) Develop **better synergies** and **strategic alignment among funders and funding programmes**.
Improving access to excellence	1) **Support the less performing Member States** to strengthen their research and innovation capacity. 2) **Stimulate policy reforms** through regular dialogue and more robust interaction with the Member States. 3) **Upgrade existing initiatives** providing strategic and coordinated support to regions and cities (e.g., *Knowledge Exchange Platform*) to a strategic level, ensuring an effective dialogue for setting priorities and promoting synergies between R&I instruments and education and training. 4) Ensure that all EU researchers, regardless of their geographical location, can produce and have access to excellent results. 5) **Strengthen mobility opportunities of researchers** through dedicated mobility schemes between industry and academia. 6) **Strengthen international cooperation** and **promote an open research environment** to cooperate with the best international talents. Global cooperation is to address global challenges.
Translating R&I results into the economy	1) Develop a framework conducive to ambitious long-term investments from the EU budget, Member States, and the private sector. 2) Guide the **development of common technology roadmaps** with industry to include R&I investment agendas from basic research to deployment. 3) Develop and test a **networking framework** in support of Europe's R&I ecosystem. 4) Update and develop guiding principles for knowledge valorisation and a code of practice for the smart use of intellectual property.
Deepening the ERA	1) Define with the Member States a ***European Competence Framework*** and a taxonomy of researchers' skills. 2) Reinforce **inter-sectoral mobility** and strengthen **academic-business cooperation** and the involvement of the private sector in training and skills development of early career researchers. 3) Launch a peer-reviewed open access publishing platform and ensure a **European Open Science Cloud** offering findable, accessible, interoperable, and reusable research data. 4) Support the European Strategy Forum on Research Infrastructures (ESFRI) to work towards a **world-class research infrastructures ecosystem**. 5) Establish a new governance structure for Technology Infrastructures.

	6) Develop a roadmap of actions for creating **synergies between higher education and research**. 7) Develop inclusive **gender equality plans** with the Member States and stakeholders (gender equality plans are a requirement in the new R&I framework programme, Horizon Europe).

Harnessing the potential of the research community

The relaunch of a European Research Area (ERA) had been discussed extensively already before the Covid-19 pandemic. The previous ERA had missed most of its targets, particularly the main one: reaching average spending across Europe of 3% of the Member States' GDP in research and development (R&D) activities. While few countries achieved such a goal, many have underperformed in the years 2000-2020, triggering a process to revise the strategy to create a unique and effective space for research in Europe.

There are two main reasons why this new attempt might prove to be more effective in the following years. Firstly, the EU budget for 2021-27 is now larger than ever, with the Member States ready to channel more money towards R&I after the disruption brought by the Covid-19 pandemic. In addition, the EU Commission under the presidency of Ursula von der Leyen has laid out ambitious plans for climate, digitalisation, and industry. These three areas will require increased efforts from research and innovation, encouraging collaboration to reach the common goals targeted. Particularly in these areas, measures slowly adopted in the past will need a boost to ensure that the R&I community does not lose momentum.

In the scope of this new ERA, some key actions are recognised as fundamental by the energy R&I community to create a better ecosystem in which researchers can provide crucial input to industry and policymakers.

First of all, it is encouraging to see that the European Commission is planning to include diverse stakeholders in its **ERA Forum for Transition**, aiming to support the Member States in coordinating and prioritising national research and innovation funding and reforms. In this context, it will be relevant for the European institutions to increase collaboration with the research community. Researchers can contribute to national plans bringing the scientific community's perspective, ensuring that funds are allocated to areas where technological breakthroughs are crucial to reach net-zero carbon emission. Making sure that this exercise is carried out in full transparency is also of critical importance.

The willingness to expand the participation to joint European efforts is also underlined in the proposal to voluntarily commit **5%** of national public R&D investments to **common programmes and European partnerships** by 2030. In concert with the Horizon Europe Missions, increased funding in pan-European initiatives will foster the creation of collaborative processes to spread the efficient use of resources to the countries that joined the European Union as of 2004 (EU-13), where funding for R&I activities is in some cases lagging behind other priorities.

The imbalance, in turn, links to the goal of supporting the Member States that perform worse than peers in terms of researchers' education. This is important for the EU-13 countries, where

the performance in training is lower than in the rest of the EU[1]. New opportunities for training and researchers' mobility across institutions should be encouraged, creating stronger links between institutions from different countries. Open access to research results and publications can also play a vital role in disseminating training and knowledge, enabling additional co-creation activities in innovation ecosystems.

In addition to more extensive inclusion, a **more robust collaboration** among EU-level instruments and funding opportunities is needed. Systematic and structural cooperation at various levels between established and new initiatives is pivotal for researchers and innovators. An example is the collaboration between the European Institute of Innovation and Technology (EIT) and the European Innovation Council (EIC) to accelerate the development and scale-up of breakthrough innovations. The EU should develop these initiatives with a solid cross-cutting nature to create synergies that maximise support for researchers and innovators across Europe.

Furthermore, **stronger links between research and industry** are needed. Scientific investigation at low TRLs level must be continuously supported, but it is also necessary to create ecosystems to support European innovation. The collaboration between research institutions and industrial alliances, or other similar initiatives closer to the market, should be increased to favour the development of common technology roadmaps for key sectors, e.g., hydrogen, offshore wind, and energy systems integration.

Spaces for **research and industry to discuss** are available today, but there is room for improvement. The European Technology and Innovation Platforms (**ETIPs**) launched in the framework of the SET-Plan activities work to implement its priorities along the innovation chain. These industry-led communities are a first important step towards more integrated innovation ecosystems.

The following steps will require strengthening the **lab-to-fab process** to speed up the transition of ideas from research to market. A solid approach is crucial for successfully integrating the Clean Energy Transition principles in the European industrial arena, ensuring that the climate neutrality by 2050 goal will not be delayed further. The EU industrial strategies shall reflect the contribution of the research community to the Clean Energy Transition.

Still, change will be hardly implemented without proper terms and conditions for the collaborations proposed. The ERA Communication puts forward **new guiding principles** for creating value from knowledge, a good step in the direction of standardising processes. However, these guidelines will prove to be insufficient if not sound, precise and efficient. Bureaucratic hurdles hamper R&I transfer, discouraging partnership and investments[2]. Calls

[1] European Commission. 2020. “Science, research and innovation performance of the EU, 2020 - A fair, green and digital Europe”. Luxembourg: Publications Office of the European Union. doi:10.2777/534046

[2] https://sciencebusiness.net/framework-programmes/news/international-horizon-projects-criticised-convoluted-bureaucracy

to reduce requirements and rules were presented as early as a decade ago[3] and continue to be supported[4].

The Commission, through the ERA, also intends to install a **code of practice** for the smart use of **intellectual property,** and it will be crucial to see how this proposition will fit with the new focus on technology sovereignty in the EU. The decision to focus on homegrown ideas and to protect them has already sparked intense discussions with the closest research partners of the EU, mainly Israel and the UK[5]. Tensions will not be easily appeased unless openness and transparency criteria, crucial to fostering innovation, are defended.

Eventually, the new ERA will support institutions through the **update of research infrastructures** to reach state-of-the-art quality. It will be essential to support infrastructure investments as openly as possible to avoid creating clusters inaccessible to some researchers and Member States. Investment in this area should continue to be treated as **Important Projects of Common European Interest (IPCEIs)**, as they will contribute to many Union objectives and bring positive spill-over effects to the internal market. This process is particularly relevant for energy research, key to achieve climate neutrality by 2050.

[3] https://sciencebusiness.net/news/75480/EU's-top-research-official-calls-for-less-bureaucracy-in-future-Joint-Technology-Initiatives

[4] https://www.ncpbrussels.be/news/443-call-for-less-red-tape-in-horizon-europe-rebutted-by-eu-official.html

[5] https://sciencebusiness.net/news/switzerland-pencilled-back-quantum-plans-no-access-uk-israel

Conclusions

The new ERA follows its unsuccessful predecessor, which failed to align R&D spending across the European Union and create an effective, open single market for research. As aforementioned, two reasons support this new attempt to be more effective: 1) a higher R&I budget for the years 2021-2027, and 2) a more robust focus on climate, digitalisation, and industry.

Researchers and innovators must engage in different activities to increase inclusion and dissemination mechanisms throughout Europe. In this sense, SUPEERA partners recommend closely following the development of multiple portfolios, including the ERA Forum for Transition, the European Pact for Research and Innovation, and the launch of new Partnerships and Important Projects of Common European Interest (IPCEIs).

Two other aspects will be essential to understand and improve the performance of the EU in R&I activities. Collaboration between researchers and industry actors must be fostered to boost innovation through shorter lab-to-market processes. The launch of the European Innovation Council under the scope of Horizon Europe is a first step that shall become the centre of a system linking research, industry, and citizens. Similarly crucial is the increase of researchers' mobility across the Member States to close the gap between different EU regions. A substantial imbalance still exists, and shared infrastructures and programmes to encourage exchange between institutions could go a long way in empowering existing networks and joint projects.

The new ERA carries a heavy burden on its shoulders and unfolds in a post-crisis context. In such a scenario, it will be essential to match the green and digital transition while ensuring sustainable competitiveness. The bar is high, but the role of the research community will be critical to achieve the proposed goals of the new ERA and ensure that Europe is well-placed to excel in the global innovation race.


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